Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC

In the Matter of	)	
	)	
Use of Spectrum Bands Above 24 GHz For Mobile Radio Services	)	GN Docket No. 14-177
	)	
	)	
Petition to Modify Parts 2 and 101 of the Commission's Rules to Enable Timely Deployment of Fixed Stratospheric-Based Communications Services in the 21.5-23.6, 25.25-27.5, 71-76, and 81-86 GHz Bands	)	RM-11809

REPLY COMMENTS OF ELEFANTE GROUP, INC.

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Elefante Group, Inc. ("Elefante Group"), by its attorneys, hereby provides its reply to comments in response to the Commission's Third Further Notice of Proposed Rulemaking ("Third FNPRM") in its *Spectrum Frontiers* proceeding in GN Docket No. 14-177.[1]

I. INTRODUCTION AND SUMMARY

In its opening Comments, Elefante Group further made the case for the Commission enabling a Stratospheric-Based Communications Service ("SBCS") in the United States through the provision of access by SBCS to the 26 GHz Band on a shared basis with incumbent services, in addition to the 22-23, 70, and 80 GHz Bands (collectively, the "SBCS Bands").[2] At the same time, Elefante Group respectfully submitted that introducing flexible mobile service, or Upper

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[1] *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services, Amendment of Parts 1, 22, 24, 27, 74, 80, 90, 95, and 101 To Establish Uniform License Renewal, Discontinuance of Operation, and Geographic Partitioning and Spectrum Disaggregation Rules and Policies for Certain Wireless Radio Services*, GN Docket No. 14-177, WT Docket No. 10-112, Third Report and Order, Memorandum Opinion and Order, and Third Further Notice of Proposed Rulemaking, FCC 18-73 (June 8, 2018) ("*Third FNPRM*").

[2] Comments of Elefante Group, Inc., GN Docket No. 17-177, RM-11809 (Sep. 10, 2018) ("*Elefante Group Comments*"). The 22-23, 26, 70, and 80 GHz Bands are, more specifically, defined by the frequency ranges, respectively, of 21.5-23.6, 25.25-27.50, 71-76, and 81-86 GHz (collectively, the "SBCS Bands.").

Microwave Flexible Use Service ("UMFUS"), into the 26 GHz Band, absent a showing of compatibility, could jeopardize the full realization of high-capacity stratospheric solutions and the benefits they would bring to both urban and rural areas.[3] Meanwhile, despite the repetition of supposed advantages, access by commercial mobile operators to the 26 GHz Band is not essential to the commercial mobile industry and the rollout of 5G networks given the tremendous amount of millimeter wave ("mmW") spectrum already made available and to be auctioned competitively beginning in November, in addition to an almost equal amount still under consideration for UMFUS.[4]

On the whole, with one exception that Elefante Group addresses below, the commenters that seek mobile industry access to the 26 GHz Band offer no new arguments for that outcome. But the suggestion of US Cellular Corporation ("US Cellular") that the 26 GHz Band will provide smaller carriers a singular opportunity to obtain the mmW spectrum that they would need to deploy 5G services – US Cellular states that this is 100 megahertz – overlooks key facts.[5] The upcoming auctions in the 24.25-24.45 and 24.75-25.25 GHz bands already will provide several opportunities for smaller carriers to obtain suitable spectrum, not to mention auctions the Commission hopes to hold later next year in higher frequency bands.

Moreover, SBCS operators should not be required to obtain spectrum through auctions. They do not require exclusive licenses, and so do not meet the statutory trigger for competitive

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[3] *Id.* at 26-68. Elefante Group appreciates the fact that TIA, while favoring the introduction of mobile services in the 26 GHz Band, encourages the Commission to undertake a comprehensive review of the Band including opportunities for stratospheric platform stations and possibly other emerging technologies. *See* Comments of the Telecommunications Industry Association, GN Docket No. 14-177, WT Docket No. 10-112, at 6 (Sep. 10, 2018).

[4] *Elefante Group Comments* at 18-26.

[5] *See* Comments of United States Cellular Corporation, GN Docket No. 14-177, WT Docket No. 10-112, at 5-6 (Sep. 10, 2018) ("*US Cellular Comments*").

bidding. Mandating that SBCS operators, nonetheless, obtain spectrum at auction is not only contrary to the fact that they, like other fixed services, can share spectrum, such a policy decision would merely reinforce the traditional ground-based technologies and stifle innovative solutions that would complement ground-based and satellite systems in the marketplace.

Further, in contrast to the compatibility SBCS would offer to the management of the 26 GHz Band, the mobile advocates fail to provide any material evidence that they can share the Band with incumbents. Rather, they appear to concede the opposite by advocating for the demotion of primary incumbents to secondary status should they want to expand their operations or introduce new deployments or services. As Elefante Group has demonstrated previously in RM-11809, SBCS, by contrast, can operate compatibly with incumbent users.

Finally, the claims made by some commenters against SBCS are unsubstantiated and appear to result from a basic misunderstanding of the communications capabilities of SBCS systems and the needs they would serve in supporting next-generation networks, both in the near- and long-term. SBCS's detractors also overlook the expertise being brought to bear by Elefante Group, with technology support from Lockheed Martin, and other aerospace companies developing stratospheric solutions.

Elefante Group respectfully urges the Commission to swiftly grant its *Petition* and, through this *Spectrum Frontiers* proceeding, take the steps necessary – such as a Further Notice of Proposed Rulemaking – to consider and adopt rules facilitating SBCS in all of the SBCS Bands in the United States.[6] By doing so, the Commission will seize the opportunity to assume a

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[6] *Elefante Group Comments* at 76-82. *See Petition to Modify Parts 2 and 101 of the Commission's Rules to Enable Timely Deployment of Fixed Stratospheric-Based Communications Services in the 21.5-23.6, 25.25-27.5, 71-76, and 81-86 GHz Bands*, Petition for Rulemaking, RM-11809 (May 31, 2018) ("*Petition*").

world leadership role in this emerging and important area of communications to complement its already laudable efforts supporting ground-based and satellite platforms.

II. THE MOBILE INDUSTRY PROPONENTS FAIL TO SUBSTANTIATE THE NEED FOR ACCESS TO THE 26 GHz BAND IN ADDITION TO WHAT THEY ALREADY HAVE AND MAY BE SOON RECEIVING

Elefante Group addressed in its Comments why the supposed advantages of commercial mobile access to the 26 GHz Band are overstated and, in fact, have already effectively been achieved by the tremendous volume of mmW spectrum that has been made available for UMFUS.[7] SES observes in its comments that ground-based terrestrial licensees are unlikely to use all of the mmW spectrum made available to them any time soon.[8] That the amount of mmW spectrum made available for flexible mobile use – namely, the 24, 26, 37, 39, and 47 GHz Bands set for future auctions, as well spectrum under consideration for UMFUS in the 32, 42, and 50 GHz Bands[9] – is extraordinary is not open to serious debate. Indeed, the questions must be asked whether making even more spectrum available to the mobile industry for the same purposes would be speculative and whether, at the same time, such continued prodigality would risk precluding other significant uses of the spectrum for both incumbent, Federal and non-Federal non-commercial-mobile uses, as well as innovative services and technologies, such as SBCS.

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7 *See Elefante Group Comments* at 18-26.

8 *See* Comments of SES Americom, Inc. and O3B Limited on Third Further Notice of Proposed Rulemaking, GN Docket No. 14-177, WT Docket No. 10-112, at 5-6 (Sep. 10, 2018) ("[I]t seems unlikely that the terrestrial industry is prepared to build out nationwide networks in each one of these bands.").

9 The 24, 32, 37, 39, 42, 47, and 50 GHz Bands are, more specifically, defined by the frequency ranges, respectively, of 24.25-24.45 and 24.75-25.25, 31.8-33.0, 37.6-38.5, 38.5-40.0, 42.0-42.5, 47.2-48.2, and 50.4-52.6 GHz.

On the other hand, Elefante Group has demonstrated both that it has specific plans to introduce new technologies and services into the 26 GHz Band for SBCS with a wide range of benefits for both current, emerging, and future markets in rural and urban areas. Elefante Group has previously explained the unique features of the 26 GHz Band for SBCS downlinks within the plausible range of spectrum for SBCS – based on engineering, computability, and environmental considerations.[10] In order to ensure that adequate spectrum is made available for platforms in addition to the mobile services and satisfy its statutory obligations under the Communications Act of 1934, as amended,[11] the Commission should allow SBCS access to the 26 GHz Band, as Elefante Group has proposed. Such action would be wholly consistent with steps that were recently taken to preserve new "core" spectrum bands for satellite services in the 40-42 and 48.2-50.2 GHz ranges, reflecting the Commission's recognition that a monocultural regulatory framework for spectrum will not serve all platforms equally.[12] The Commission, by being mindful of the needs of the Fixed Satellite Services, is to be applauded for taking steps toward a more balanced spectrum management approach to facilitate multiple platforms. Elefante Group

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10 *Elefante Group Comments* at 6-17; *see also Petition* at 74-79.

11 47 U.S.C. §§ 151 (establishing the Commission to "to make available, so far as possible, to all the people of the United States . . . a rapid, efficient, Nation-wide, and world-wide wire and radio communication service with adequate facilities at reasonable charges"); 157 ("It shall be the policy of the United States to encourage the provision of new technologies and services to the public."); 303 (stating that the Commission will "[s]tudy new uses for radio, provide for experimental uses of frequencies, and generally encourage the larger and more effective use of radio in the public interest"); 309 (empowering the Commission to "promot[e] economic opportunity and competition and ensur[e] that new and innovative technologies are readily accessible to the American people"); 1302 ("The Commission and each State commission with regulatory jurisdiction over telecommunications services shall encourage the deployment on a reasonable and timely basis of advanced telecommunications capability to all Americans.").

12 *See Use of Spectrum Bands Above 24 GHz For Mobile Radio Services, et al.*, GN Docket No. 14-177, *et al.*, Second Report and Order, Second Further Notice of Proposed Rulemaking, Order on Reconsideration, and Memorandum Opinion and Order, 32 FCC Rcd 10988, at ¶¶ 185-192 (2017) ("*Second Spectrum Frontiers Order*").

encourages the Commission to continue on this path by giving stratospheric operators a chance to deploy their systems and bring their unique mix of benefits to the public.

With a single exception, the mobile industry proponents of UMFUS access to the 26 GHz Band simply parrot their earlier, high-level attempted justifications for such access to which Elefante Group has already responded.[13] US Cellular contends now that mobile access to at least some portion of the 26 GHz Band is important for small carriers it avers will be unlikely to compete for spectrum in upcoming auctions, in the 27.50-28.35 GHz band ("28 GHz Band"), for example.[14] US Cellular explains that 100 megahertz of spectrum is enough spectrum for smaller carriers to deliver next-generation services.[15] US Cellular's apparent apprehensions about the upcoming auctions is exemplified by its concern that having to compete for 425 megahertz blocks at auction in the 28 GHz Band will put smaller carriers in the position of bidding for bandwidth they have no use for, driving up their costs.[16] However, US Cellular overstates the benefits of possible auctions of smaller blocks in the 26 GHz Band were it to be made available for UMFUS. There will be auctions of smaller blocks in the 24 GHz Band, *i.e.*, 24.25-24.45 and 24.75-25.25 GHz, as well as in the 37.6-38.5 ("37 GHz"), 38.5-40.0 ("39 GHz"), and 47.2-48.2 GHz ("47 GHz") Bands. Indeed, the 24 GHz Band generally will be auctioned off in seven 100-megahertz blocks, giving smaller carriers plenty of opportunity to obtain spectrum commensurate with their intended operations.[17]

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13 *See, e.g.*, Comments of T-Mobile USA, Inc., GN Docket No. 14-177, WT Docket No. 10-112, at 16-19 (Sep. 10, 2018) ("*T-Mobile Comments*"); *US Cellular Comments* at 3-9.

14 *US Cellular Comments* at 5-6.

15 *See id.* at 6-7.

16 *Id.* at 6.

17 *See Auctions of Upper Microwave Flexible Use Licenses for Next-Generation Wireless Services*, AU Docket No. 18-85, Public Notice, FCC 18-109, at ¶¶ 7, 11 (Aug. 3, 2018).

Moreover, the Ka-Band spectrum is not distinctly advantageous for ground-based systems in comparison with Q-Band spectrum. The 37, 39, and 47 GHz Bands, which will be auctioned in bandwidths of 100 or 200 megahertz,[18] are suitable for the same types of deployments by ground-based mobile carriers over comparable geographic scales as Ka-Band spectrum, including for 5G service deployments. Further, UMFUS licensees in the mmW bands are capable of disaggregating and partitioning their licenses.[19] This would give smaller carriers, especially in rural areas where the full channel bandwidths are less likely to be useful to winning bidders, the chance to get the spectrum they need, where they need it, in the secondary market if what is auctioned is too "large." In short, US Cellular fails to support a case for the 26 GHz Band being uniquely suited for giving smaller carriers the opportunity to bid for spectrum suitable for their needs.

III. FORCING SBCS OPERATORS, WHICH DO NOT REQUIRE EXCLUSIVE LICENSES, TO OBTAIN SPECTRUM THROUGH AUCTIONS DESIGNED TO REINFORCE GROUND-BASED SOLUTIONS WOULD BE CONTRARY TO THE PROMOTION OF NEW TECHNOLOGIES AND SERVICES

The suggestion of at least one commenter that SBCS operators should compete for the spectrum they desire at auction misses the mark and promotes an unsound spectrum policy favoring one industry segment.[20] As an initial matter, SBCS does not require exclusive use of

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Currently, a subset of the blocks in nine of the 416 PEAs in the 24 GHz Band (less than two percent) are either partially or wholly encumbered in favor of one incumbent, M&M Brothers, LLC. *Id.* at ¶ 220. However, the Commission is considering modification applications from M&M Brothers, LLC that would increase the number of blocks available in the 24 GHz Band auction without encumbrance. *Id.*

18 *See Use of Spectrum Bands Above 24 GHz For Mobile Radio Services*, GN Docket No. 14-177, Fourth Further Notice of Proposed Rulemaking, FCC 18-110, at ¶¶ 9-13 (Aug. 3, 2018).

19 *Second Spectrum Frontiers Order* at ¶ 27.

20 *See* Comments of AT&T Services, Inc., GN Docket No. 14-177, WT Docket No. 10-112, at 15 (Sep. 10, 2018) ("*AT&T Comments*"). Similarly, one commenter, Qualcomm, contends

spectrum: mutual SBCS operators can serve common geographic areas in the same spectrum.[21] Consequently, the statutory trigger for auctions of SBCS spectrum is not present.[22] Elefante Group submits that by advocating, in effect, that the Commission artificially impose mutual exclusivity on SBCS operations, AT&T is advocating that the Commission engage in inefficient spectrum management.[23] Forcing SBCS operators to compete against each other (and non-SBCS operators) for access to spectrum through competitive bidding would forego the ability of multiple Stratospheric Platform Stations ("STRAPS") to operate in the same spectrum serving the same geographic areas. Such a policy would undermine potential competition and condone less intensive use of the spectrum resource.

In addition, were spectrum in the 26 GHz Band auctioned over Partial Economic Areas ("PEAs"), the license areas would rarely if ever conform, even roughly, to the generally circular STRAPS coverage area defined by a radius of 70 km.[24] This is especially the case because PEAs come in all shapes and sizes, with the median PEA size in the continental United States noticeably smaller than the coverage area of a STRAPS: approximately 4,900 mi^2 median PEA

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that SBCS systems unaffiliated with HAPS should not be permitted in the 26 GHz Band. *See* Comments of Qualcomm Incorporated, GN Docket No. 14-177, WT Docket No. 10-112, at 14 (Sep. 10, 2018). As Elefante Group explained at length in its Comments, limiting the deployment of SBCS to individual UMFUS licensees would almost certainly ensure, for economic and operational reasons, that high-capacity, low-latency stratospheric solutions are not introduced in the United States. *See Elefante Group Comments* at 68-76.

21 *See Petition* at 79-87, 92-101; *see also id.* at Appendices T and U.

22 47 U.S.C. § 309(j).

23 Only by overlooking the fact that multiple SBCS operators will be able to share the same spectrum and that SBCS operators will be able to operate compatibly with other incumbents, who will be able to grow and expand their operations, can AT&T make the overreaching claim that Elefante Group seeks the use of the 26 GHz Band for a single entity. *See AT&T Comments* at 14. As made clear in its *Petition* and all of its filings, Elefante Group proposes that SBCS systems access the spectrum on a non-exclusive basis.

24 *See Petition* at 13.

size versus 6,000 mi^2 STRAPS coverage area defined by a radius of 70 km.[25] Indeed, 60% of PEAs in CONUS are under 6,000 mi^2. Moreover, the bandwidth of UMFUS licenses is too small to justify SBCS investments, as Elefante Group explained in its Comments.[26] Leaving the mismatch of geographic license size and STRAPS coverage radius aside, to achieve the high capacity attainable on an SBCS system, *i.e.*, 1 Tbps or greater, a tremendous number of UMFUS licenses would have to be obtained in the same geographic area to gain access to sufficient spectrum.[27] In short, while the Commission should not, as a theoretical matter, preclude SBCS-type operation in any UMFUS spectrum bands, it should not require all bands to be UMFUS bands and SBCS operators to compete in auctions with very different ground-based services with wholly distinct spectrum requirements.

The recent battles over the characteristics of spectrum licenses that will be made available at auction in other bands, such as the 3.5 GHz band, including license area size, bandwidths, and license term, underscore that there is no one-size-fits-all approach that will promote all service types, even while permitting a flexible use approach to operational and technical requirements.[28] Elefante Group respectfully submits that the Commission should be dissuaded from reaching the facile conclusion that, by allowing SBCS operators, among others, to compete in spectrum auctions designed to support mobile carriers' deployment of ground-based services, stratospheric platforms would be promoted. Consequently, requiring SBCS operators to obtain spectrum at auction is not only contrary to the statutory requirements for

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25 *See Elefante Group Comments* at 69-74.

26 *Id.* at 69-70.

27 *Id.* at 70.

28 *See Promoting Investment in the 3550-3700 MHz Band, et al.*, GN Docket No. 17-258, *et al.*, Notice of Proposed Rulemaking and Order Terminating Petitions, 32 FCC Rcd 8071 (2017).

when auctions are necessary, it would merely reinforce the traditional ground-based technologies and stifle innovative solutions that would complement ground-based and satellite systems in the marketplace.

IV. THE ADVOCATES OF MAKING THE 26 GHz BAND ACCESSIBLE FOR COMMERCIAL MOBILE FAIL TO DEMONSTRATE MOBILE CARRIERS CAN CO-EXIST WITH THE INCUMBENTS

Elefante Group has proposed that the SBCS gain access to the 26 GHz Band in a manner that ensures SBCS will operate compatibly with incumbents, whether fixed, aeronautical mobile, or passive services.[29] The regulatory framework proposed by Elefante Group for SBCS would ensure co-existence that permits both incumbents and SBCS operators to grow existing operations and establish new operations, subject to coordination.[30]

The comments of those who advocate for commercial mobile industry access to the 26 GHz Band take a very different tack, reflecting a markedly different approach to spectrum management. As they have repeatedly argued regarding low-, mid-, and high-band spectrum, the mobile carriers advocate for exclusive, area-based licensing designed to favor licensees accessing the spectrum with as few obligations to share as possible – preferably none at all.[31] Although these commenters propose that, in theory, currently-deployed incumbent operations be protected from harmful interference, they request that the Commission ensure that any subsequent incumbent deployments or expansions of existing incumbent operations be purely on

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29 *See Elefante Group Comments* at 14-17.

30 *See Petition* at 66-81.

31 *See, e.g., AT&T Comments* at 13-14; *T-Mobile Comments* at 17; *US Cellular Comments* at 5.

a secondary basis to mobile users.[32] In other words, government and other users are free to deploy new facilities, but on the condition that they must accept any interference received from mobile operations and may not cause harmful interference to mobile operations. Even with regard to the existing operations of incumbent users, the commercial mobile commenters provide no detail for exactly how that protection would be assured.[33]

No studies were provided by the commercial mobile industry analyzing the potential for co-existence of commercial mobile operations, *i.e.*, UMFUS, with existing incumbents, such as those defining the distances over which incumbents would be affected around UMFUS base stations and the coordination that would be required. As Elefante Group explained in its Comments, supported by compatibility analyses conducted by Lockheed Martin, even a single 26 GHz Band mobile base station operating under UMFUS-permitted power levels would create

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[32] *See, e.g.*, Comments of Competitive Carriers Association, GN Docket No. 14-177, WT Docket No. 10-122, at 5 (Sep. 10, 2018) (arguing that after UMFUS licenses are awarded future incumbent users should be secondary); *T-Mobile Comments* at 17 (stating that the Commission should "allow future federal use only if such use does not interfere with non-federal operations"); *AT&T Comments* at 13 (asserting that federal sharing in 26 GHz should be managed in a way that provides full protection of auction winners). Samsung, for one, pays lip service to the need to preserve the ability of incumbent users to develop and deploy new technologies, but, like the other mobile proponents, advocates for exclusive licensing so as not to impose restrictions on UMFUS operators. *See* Comments of Samsung Electronics America, GN Docket No. 14-177, WT Docket No. 10-122, at 4-8 (Sep. 10, 2018) ("*Samsung Comments*"). 5G Americas asserts in summary fashion that spectrum sharing is possible on a dynamic basis or on a time or geography domain, but does not provide specifics. *See* 5G Americas Comments on 26 GHz Band, GN Docket No. 14-177, at 3, Attachment (Sep. 10, 2018).

[33] As the Commission's recently-released Notice of Proposed Rulemaking regarding the 3.7-4.2 GHz band makes clear, the issue of how incumbents are to be protected can be an extremely complex one. *See Expanding Flexible Use of the 3.7 to 4.2 GHz Band, et al.*, GN Docket No. 18-122, *et al.*, Order and Notice of Proposed Rulemaking, FCC 18-91, at ¶¶ 2, 27-48 (July 13, 2018). Consequently, it is rather surprising that none of the comments of advocates for mobile access to the 26 GHz Band provide detail as to how existing incumbent operations would receive protection from new mobile entrants. Samsung, at least, suggests that there be coordination, but offers nothing further about the nature of that coordination. *See Samsung Comments* at 7-8.

particular threats of harmful interference to fixed, aeronautical mobile, and passive service incumbents over considerable distances.[34]

It is not even clear from the mobile proponents' comments whether any formal analysis has been completed in support of their position of providing commercial licensees access to the 26 GHz Band *under UMFUS technical and operational rules*. A few of the commenters point to certain studies prepared in support of the upcoming 2019 World Radiocommunication Conference examining potential use of the 26 GHz Band for International Mobile Telecommunications ("IMT"),[35] but these studies, as Elefante Group demonstrated in detail in its Comments, whatever their merits, do not provide assurance about compatible UMFUS use of the 26 GHz Band.[36] No mitigation methods were offered or discussed by commercial mobile commenters to enhance the compatibility of their systems with incumbent operations, apart from

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[34] *See Elefante Group Comments* at 53-63; *see also id.* at Attachments A and B. As Elefante Group explained, were other operational parameters of the UMFUS rules also factored into compatibility analyses, as well as the effect from expected densities of UMFUS-type base stations, there is every reason to believe that the interference effects would be magnified further in many localized environments. *See id.* at 54; *see also id.* at Attachment A at A-13-A-14, Attachment B at B-13-B-14.

[35] *See, e.g.*, *T-Mobile Comments* at 16, n.53, 17 (referencing studies looking at IMT compatibility with Earth Exploration Satellite Service/Space Research Service operations); Comments of CTIA, GN Docket No. 14-177, WT Docket No. 10-122, at 10-11 (Sep. 10, 2018) (same) ("*CTIA Comments*"); *AT&T Comments* at 13 (same, and referencing ITU-process related studies).

[36] *See Elefante Group Comments* at 53-67; *see also id.* at Attachments A & B. For example, CTIA suggests that separation distances between Earth Exploration Satellite Service/Space Research Service receive stations and UMFUS base stations could be smaller than the results shown by some of the site-specific International Telecommunications Union studies, *see CTIA Comments* at 10-11, yet CTIA does not suggest how the appropriate separation distances would be determined or take into account the potentially much more pernicious UMFUS-type operations that could pose interference threats relative to the comparatively more benign impact of the narrow IMT use case examined by the ITU Studies in question. The ITU Studies use case, as Elefante Group explained in its Comments, presumes 30 dB less transmit power than permitted UMFUS licensees and restricted antenna characteristics, *e.g.*, at least 10 degrees downtilt, relative to the full range operational freedom enjoyed by UMFUS operators.

non-specific references to "coordination zones" unaccompanied by discussions of coordination procedures within those zones. To the contrary, there is every indication that commercial mobile proponents seek to have the UMFUS technical and operational rules adopted in other bands, such as the 24 and 28 GHz Bands, imported wholesale into the 26 GHz Band without any accommodations to create prospects for the compatibility of mobile operations with incumbent services in an ongoing manner.[37]

In the end, commercial mobile advocates do not argue for co-existence with incumbents except in the most formal and static senses of the concept. Indeed, CTIA even goes so far to suggest that incumbent aeronautical systems and UMFUS cannot share the same band.[38] In other words, aeronautical mobile systems beyond, possibly, incumbent installations would need to find another spectrum home. CTIA does not offer any suggestions where an appropriate new home for these aeronautical services would be.

V. SBCS WILL MEET KEY NEXT-GENERATION MARKET NEEDS IN A TIMELY AND EFFICIENT FASHION WHILE OPERATING COMPATIBLY WITH OTHER 26 GHz USERS

For the most part, commercial mobile industry commenters, unlike Elefante Group, did not respond to the inquiries the Commission posed in the *Third FNPRM* regarding SBCS operation in the 26 GHz Band.[39] Instead, seeking to prevent the introduction of innovative stratospheric solutions in the 26 GHz Band, the commercial mobile proponents resort to renewing their unsubstantiated criticisms of SBCS in an effort to prevent new technologies from accessing the Band. As explained below, these criticisms have no merit.

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37 *See T-Mobile Comments* at 16-19; *US Cellular Comments* at 3-9; *Samsung Comments* at 5-8; *CTIA Comments* at 7-11.

38 *See CTIA Comments* at 15.

39 *See Third FNPRM* at ¶¶ 85-87.

As Elefante Group discussed in its Reply Comments on its *Petition*, SBCS will serve core market needs as next-generation networks are rolled out.[40] SBCS, enabling day-one ubiquitous reach within large service areas (after STRAPS deployment) of high-capacity, low-latency connectivity, will support network densification in urban areas, providing the critical elements of backhaul to small cell deployments *regardless of frequency band* for 5G, 4G, and IoT applications.[41] Similarly, in less populated rural areas (as well as urban areas), SBCS will provide critical connectivity in hard-to-access areas and localities bypassed by mobile carriers targeting high-return locations.[42] Further, SBCS will support enterprise Wide Area Networks and fixed consumer Internet access.[43] Contrary to blatant assertions of mobile carriers seeking exclusive use of spectrum, none of these markets that SBCS will serve are "niche," "speculative," or "experimental."[44]

Elefante Group submits that, if the foregoing services are niche, speculative, or experimental, then the entire 5G enterprise in the mmW bands merits the same characterization. As the Commission well knows, just a few years ago, the suitability of mmW bands for mobile operations was viewed with almost universal doubt, and, in fact, the mobile industry was displeased when NTIA first suggested that some of the spectrum needed to meet the alleged needs of the mobile industry for 500 megahertz by 2020 could be provided by repurposing

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40 Reply Comments of Elefante Group, Inc., RM-11809, GN Docket No. 14-177, at 12-29 (Aug. 15, 2018) ("*Elefante Group Petition Reply Comments*").

41 *Id.* at 12-13.

42 *Id*.

43 *See Elefante Group Comments* at 7-8.

44 *See, e.g.*, *CTIA Comments* at 8-9; *AT&T Comments* at 3; *T-Mobile Comments* at 18.

spectrum above 3 GHz. Further, 5G services have not been rolled out and are still in search of a business case based on recent reports and even the Chairman's own remarks.[45]

The timeframe projected by Elefante Group for SBCS deployment is not at odds with next-generation rollouts. While Elefante Group anticipates being ready for commercial deployment in approximately four years, *i.e.*, the latter part of 2022, provided the regulatory framework enabling SBCS is in place,[46] the company submits that this will be well-timed for supporting a fuller rollout of next-generation services, as 5G rollout in the fullest sense is not expected for a few years.[47] Moreover, unlike say, ground-based 4G or 5G, the services provided by an SBCS are regularly upgradeable and, in a large sense, future proof. So, unless the evolution of ground-based fixed and mobile networks will come to a standstill after 5G is deployed, SBCS can be there with its particular advantages to support the future evolution of the American communications marketplace as future network generations are introduced, which Elefante Group expounded on at length in its *Petition*.[48]

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45 *See* Jonathan Make, "Demand for 5G May Not Be High, Rollout May Take Years, TPI Told," Communications Daily (Aug. 22, 2018) (discussing broadband industry representatives' concerns regarding the challenges in forecasting future consumer demand for 5G technologies); Kim Hart, "How 5G may widen the rural-urban digital divide," AXIOS (July 25, 2018) (quoting Chairman Pai stating that infrastructure deployment issues can complicate the business case for rural 5G networks); Statement of Chairman Ajit Pai, *Accelerating Wireless Broadband Deployment by Removing Barriers to Infrastructure Investment, Accelerating Wireline Broadband Deployment by Removing Barriers to Infrastructure Investment*, WT Docket No. 17-79, WC Docket No. 17-84, Declaratory Ruling and Third Report and Order, FCC 18-133 (Sep. 27, 2018) (stating that regulatory barriers continue to impede the deployment of 5G networks nationwide); *see also Elefante Group Petition Reply Comments* at 17-20 (summarizing the limited nature of the current 5G deployment plans of the nationwide mobile wireless carriers).

46 *Petition* at 21.

47 *See Elefante Group Petition Reply Comments* at 17-20.

48 *See Petition* at 21-41. Samsung's suggestion that enabling high-capacity, low-latency SBCS will, somehow, contrary to all reasonable expectations, "impede the progress" of next-generation networks flies in the face of common sense and overlooks the backhaul and other

Further, early experience with prospective stratospheric platforms when they were in their conceptual phase provides no realistic indicators about the future merits of SBCS. As Elefante Group detailed in its *Petition*, a number of technological breakthroughs and developments have made the present time ripe for realizing stratospheric platform deployments.[49] Elefante Group, for its part, has enlisted the unquestioned technological expertise of Lockheed Martin in support of realizing its commercial vision for SBCS. A number of other major aerospace companies are pursuing similar objectives, including Airbus and Thales.[50] The statements of detractors that stratospheric communications have been tried and failed are unwarranted.[51] Moreover, such baseless criticisms are completely at odds with the direction of Congress[52] and the intentions of this Commission to promote new and innovative services.[53]

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network connectivity requirements of next-generation networks, particularly if they are to reach all Americans. *See Samsung Comments* at 8.

[49] *See Petition* at 6-12 (discussing breakthroughs in airship and communications payload-related areas supporting advanced, persistent stratospheric communications solutions).

[50] *Id.* at 49-50.

[51] *See, e.g., T-Mobile Comments* at 18-19. Further, while T-Mobile notes that the Elefante Group prototype is expected to fly in late 2020, this is not in any way "untimely" relative to 5G deployment. The launch of the prototype will be near the very end of the development process before commercial production and launch of airships. Further, STRAPS, once deployed, will reach a 6,000 mi^2 area on day one, avoiding the lengthy and geographically selective buildouts and upgrades that can be expected with ground-based networks over comparable metro-sized-plus areas.

[52] *See* Section 7 of the Communications Act of 1934, as amended. 47 U.S.C. § 157.

[53] *See, e.g.*, Remarks of FCC Chairman Ajit Pai at Carnegie Mellon University's Software Engineering Institute, at 6-7 (March 15, 2017) ("Going forward, I want the FCC to facilitate, rather than frustrate, innovation . . . . The United States must continue to lead the world in wireless innovation. We led the way in the deployment of 4G LTE, and we must do the same in 5G. With 5G, we can use millimeter wave spectrum to produce multi-gigabit speeds. 5G could transform the wireless world and provide even more robust competition to wired networks."); Statement of Commissioner Jessica Rosenworcel, *Second Spectrum Frontiers Order* ("[W]e are

As Elefante Group explained in its initial Comments, by adhering to a well-established power flux density ("PFD") mask designed and accepted to protect ground-based fixed and mobile services from overhead service, *i.e.*, satellites, SBCS will not cause harmful interference to such services.[54] Further, Elefante Group amply showed in its *Petition* and its Reply Comments on its *Petition*, supported by over a score of compatibility analyses conducted by Lockheed Martin, that SBCS will be able to co-exist with incumbents in the 26 GHz Band as well as other SBCS Bands, and do so in a way that allows incumbents to grow and expand *without seeking to relegate them to secondary status*.[55] Consequently, accusations that SBCS is not a spectrally compatible service[56] are wholly unfounded and extremely ironic as such baseless claims are set out by commercial mobile proponents who have affirmed their true colors by advocating secondary status for any future incumbent deployment or expansion and exclusive licensing of the band. Similarly, while SBCS can operate without harmfully interfering with UMFUS-type services under the PFD mask proposed in the *Petition*, it would appear UMFUS is unable return the favor to SBCS.[57]

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simply not moving fast enough. We risk ceding our current leadership in the world. We risk losing our innovative edge. We risk having the United States becoming a follower in the next generation of mobile technology.").

54 *See Elefante Group Comments* at 16, 63-64.

55 *See Petition* at 55-85, Appendices; *Elefante Group Petition Reply Comments* at 29-64, Exhibits. Contrary to AT&T's claims that incumbents do not believe sharing with SBCS is possible, Elefante Group has met with the federal incumbents in the 26 GHz Band and shared its compatibility analyses. From these discussions, which are ongoing, Elefante Group is unaware of any conclusions by the incumbents that sharing with SBCS cannot be achieved in an acceptable manner.

56 *See AT&T Comments* at 14.

57 Elefante Group reiterates its willingness to explore with the commercial mobile industry potential compatible uses of the 26 GHz Band.

Finally, SBCS will be deployed in a highly spectrally efficient manner. As Elefante Group has explained, its design will reuse spectrum up to 180 times over a 70 km-radius service area achieving over 4 bps/Hz.[58] Moreover, SBCS deployments will ensure that high-capacity wireless connectivity is available in the entire coverage area on day one. Traditional ground-based wireless systems over comparable areas are notorious for having coverage gaps and areas that the carriers simply bypass for later coverage, reducing the efficient use of the spectrum. There is no reason to believe that the same will not be the case, or even exacerbated, in the mmW bands, given the potentially localized nature of expected UMFUS deployments, at least for the foreseeable future. Moreover, SBCS systems can share with each other, such that same spectrum can be reused to serve the same market by another provider or a second (or third) platform of the initial entrant. Finally, by operating compatibly with existing services, SBCS ensures even more intense use of the spectrum resources as a whole as incumbents and SBCS grow and expand. Consequently, claims made that SBCS is somehow inefficient are, at best, ill-informed.[59]

VI. CONCLUSION

For the foregoing reasons and those set out in Elefante Group's initial Comments in this proceeding, the Commission should take steps to facilitate the introduction of SBCS in the SBCS Bands as proposed in Elefante Group's *Petition*, including in the 26 GHz Band. At the same time, the Commission should proceed with caution as it considers whether to introduce flexible mobile use, *i.e.*, UMFUS, in the 26 GHz Band. Unless the Commission concludes that UMFUS licensees could operate on a compatible basis with incumbents and SBCS in the Band, *and allow*

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58 *See Petition* at 42-59.

59 *See T-Mobile Comments* at 18.

for expansion of other services within the Band on a co-primary basis, the Commission should not allow flexible mobile services access to the Band. Doing so without such demonstrations of compatibility would stifle the growth and deployment of new incumbent services and could jeopardize the realization of advanced stratospheric-based communications in this country.

Respectfully submitted,

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